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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/723,746      | 11/25/2003  | Hongyu Wang          | 03049US             | 8965             |

7590

05/03/2006

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| EXAMINER |
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UMEZ ERONINI, LYNETTE T

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1765

DATE MAILED: 05/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                            |                                     |  |
|------------------------------|--------------------------------------------|-------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/723,746       | <b>Applicant(s)</b><br>WANG, HONGYU |  |
|                              | <b>Examiner</b><br>Lynette T. Umez-Eronini | <b>Art Unit</b><br>1765             |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                         |                                                                             |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                                |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____                                                             | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Request for Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/12/2006 has been entered because the formerly applied reference failed to address .

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 1765

4. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (US 6,027,699).

Miura teaches, a polishing composition useful for polishing semiconductors (column 1, lines 1-2) and which comprises silica and water (Abstract column 3, lines 8-11). The content of silica is from 0.1 to 50 by weight (column 3, lines 56-59). Various additives such as surfactants such as sodium alkylbenzene sulfonate and a condensate of formalin with naphthalene sulfonic acid (same as applicant's polynaphthalene and sulfonated polynaphthalene surfactant) and aluminum oxides, zirconium oxides and titanium oxides, can be incorporated into the polishing composition (column 5, line 51 - column 6, line 8). Miura also teaches the polishing composition has a pH of at least 7 (column 6, lines 33-35), which encompasses a pH of less than 10. The aforementioned reads on,

An aqueous polishing slurry suitable for chemical mechanical polishing semiconductor substrates, comprising, by weight percent:

0.1 to 40 weight percent metal oxide particles, the metal oxide particles having a surface and a positive surface charge;

at least polynaphthalene surfactant; and

a balance of water with the slurry, **in claim 1;**

wherein the metal oxide particles comprise an abrasive oxide selected from the group comprising alumina, aluminum hydroxide oxide, ceria, iron oxide, lanthanum oxide, magnesium oxide, nickel oxide, silica, titania, yttria and zirconia, **in claims 2, 5, and 7;**

Art Unit: 1765

wherein the metal oxide particles are alumina, **in claim 3**;

An aqueous polishing slurry suitable for chemical mechanical polishing semiconductor substrates, comprising, by weight percent:

0.25 to 25 and 0.5 to 15 weight percent metal oxide particles, the metal oxide particles having a surface and a positive surface charge and the metal oxide particles comprising an abrasive oxide selected from the group comprising alumina, aluminum hydroxide oxide, ceria, iron oxide, lanthanum oxide, magnesium oxide, nickel oxide, silica, titania, yttria and zirconia;

at least polynaphthalene surfactant; and

a balance of water, respectively **in claims 4 and 6**.

Since Miura's polishing composition comprises the same chemicals as that of Applicant's polishing slurry, then using Miura's composition in the same manner as claimed by Applicant would result the same in the polynaphthalene surfactant being detectable in solution of the aqueous polishing slurry, as recited **in claims 1, 4, and 6**.

Miura differs in failing to specify the content of polynaphthalene surfactant as recited in claims 1, 4, and 6 and the slurry having a pH of less than 5 and 4, respectively in claims 4 and 6.

However, Miura illustrates the specific combination of a metal oxide particles, surfactant, and water is known. Since Miura teaches the same composition as claimed in the present invention, then using Miura's composition in the same manner as claimed by applicant would result the same in polynaphthalene surfactant for adsorption with at least a portion of the surface of the metal oxide particles in situ and for reducing

Art Unit: 1765

scratching of the semiconductor substrates. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select any proportion surfactant and pH in the Miura reference that would effectively accomplish the disclosed composition because it has been held that there is no invention where the difference in proportions is not critical and was ascertained by routine experimentation because the determination of workable ranges is not considered inventive. See *In re Swain and Adams*, 70 USPQ 412 (CPA 1946).

### ***Response to Arguments***

5. Applicant's arguments filed 3/22/2006 have been fully considered but they are not persuasive. Applicant traverses the 103(a) rejection of claims 1-7 over Miura et al. (US 6,027,699). Applicant argues, Miura fails to disclose using polynaphthalene surfactant for adsorption with metal oxide particles having positive surface charge. Applicant's argument is unpersuasive because no patentable is given to intended use of the composition.

Applicant argues the Miura references fails to disclose the use of alumina sol, fumed titania and fumed zirconia as optional additives to the fumed or colloidal silica. Applicant's argument is unpersuasive because these additives are not claimed.

Applicant argues the claims have been amended to include the negative charged polynaphthalene surfactant in the polishing solution. Applicant's argument is unpersuasive because the said surfactant is not claimed.

Applicant argues the Miura reference fails to disclose polynaphthalene surfactant adsorbs onto alumina particles to reduce scratching of semiconductor substrates and operates with negatively charged silica particles; and polynaphthalene surfactants will not adsorb onto negatively charged silica particles.

Miura's failure is acknowledged. However, Miura's polishing composition comprises silica and water (Abstract, column 1, lines 1-2; and column 3, lines 8-11); various additives such as surfactants such as sodium alkylbenzene sulfonate and a condensate of formalin with naphthalene sulfonic acid (same as applicant's polynaphthalene and sulfonated polynaphthalene surfactant) and aluminum oxides, zirconium oxides and titanium oxides, can be incorporated into the polishing composition (column 5, line 51 - column 6, line 8). Since Miura illustrates the specific combination of a metal oxide particles, surfactant, and water is known and teaches the same composition as claimed in the present invention, then using Miura's composition in the same manner as claimed by applicant would result the same in polynaphthalene surfactant for adsorption with at least a portion of the surface of the metal oxide particles in situ and for reducing scratching of the semiconductor substrates.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 571-272-1470. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1765

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Art Unit 1765

ltue

April 26, 2005

**NADINE G. NORTON**  
**SUPERVISORY PATENT EXAMINER**

